



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
215 NORTH 17TH STREET
OMAHA, NEBRASKA 68102-4978



February 6, 1996

Environmental Remediation Branch

Ms. Susan J. Chaki, Unit Leader
Colorado Department of Public Health and the Environment
Hazardous Waste Cleanup Unit - Federal Facilities Program
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

Dear Ms. Chaki:

Following the receipt of an undated memorandum from Ken Niswonger, of your staff, regarding the "Acidification Preservation of Volatile Samples", members of the Omaha District technical staff have researched chemical preservation of aqueous samples for analysis of volatile organics (Method 8260) in accordance with SW-846. Telephone conversations with Messrs. Jim Brown and Barry Lesnick at the Headquarters of U.S. Environmental Protection Agency indicated that Chapter 11 of SW-846 Method is obsolete and the protocol provided in "RCRA Groundwater Monitoring Draft Technical Guidance" should be implemented along with Chapter 2 of SW-846. According to Mr. Brown, there are no plans to make the Draft Technical Guidance manual final because EPA reviews this as an active document which will continue to evolve with research conducted in the environmental field.

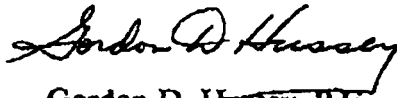
The following is a summary of what our research has found:

Sample preservation is undertaken to 1) retard biological action, 2) retard chemical reactions such as hydrolysis or oxidation, and 3) reduce sorption effects. Chapter 4 of the SW-846 Method indicates that samples need to be cooled to 4°C and pH adjusted to less than 2 with one of three acids. EPA's Method Group has stated that the changes that will occur in a sample due to biological activity have a greater impact on the analysis than any changes which might result from the acidification of the sample in accordance with the current technical guidance. Cooling alone is not sufficient due to the confirmation of cryophilic bacteria in biological samples collected at Pueblo Army Depot which are still active at 4°C.

In the August 1989 Final Report on the "Stability of Volatile Organics in Environmental Water Samples: Storage and Preservation" samples were preserved with hydrochloric acid (HCl), sodium bisulfate, and ascorbic acid. Study results indicated that all three acids effectively reduced the degradation and preserved the samples. However, sodium bisulfate is recommended for the preservation of volatile organic compounds in environmental water samples for the following reasons: 1) this acid is readily available, inexpensive, and free from interferences; 2) it is non-corrosive and can be added to sampling vials prior to their transport to the field; 3) the pK is 1.91, ensuring that the pH of the sample will be reduced to just slightly less than 2 regardless of the amount added; 4) sodium bisulfate is readily soluble in the aqueous matrix; and 5) the additional ionic strength resulting from the addition of sodium bisulfate can actually improve the reliability of the analytical method by increasing purge efficiency.

If you have any questions or concerns, please contact the Technical Manager, Ms. Linda J. White, P.E., at (402) 221-7672 or either of the chemists involved with these sites, Ms. Paula Peters (402) 221-7699 or Ms. Susan George (402) 221-7746.

Sincerely,



Gordon D. Hussey, P.E.
Chief, Environmental Remediation Branch
Engineering Division

Enclosure